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Solutio problematum quorundam astronomicorum

Leonhard Euler

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SOLVTIO PROBLEMATVM QVORVNDAM ASTRONOMICORVM.

AVCTORE

Leonh. Eulero.

Problema 1.

Data planetae aequatione maxima, inuenire orbitae eius excentricitatem.

Solutio.

Conuertatur aequatio maxima in minuta secunda, sitque eorum numerus $=m$; dico fore distantiam planetae a Sole mediam ad excentricitatem vt 412533 ad numerum m ; si quidem aequatio non fuerit nimis magna. At si aequatio admodum fuerit ingens, posita ratione distantiae mediae ad excentricitatem vt 1 ad v , erit $v = \frac{m}{412533} - \frac{m^2}{32(412533)^2}$. Q.E.I.

Problema 2.

Data excentricitate orbitae planetaris, inuenire aequationem maximam.

Solutio.

Sit 1 ad v vt distantia planetae a Sole media ad excentricitatem, et sit m numerus minutorum secundorum aequationis maximae, qui quaeritur, dico fore $m = 412533(v + \frac{v^2}{32})$; vel per logarithmos erit $\log. m =$
Tom. VII. N 5.

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$5,6154596 + l(v + \frac{v^7}{32})$. Vbi notandum est, nisi excentricitas fuerit vehementer magna loco quantitatis $v + \frac{v^7}{32}$ sumi posse tantum v . Q. E. I.

Problema 3.

Data excentricitate orbitae planetaris, inuenire anomaliam mediam, cui aequatio maxima respondet.

Solutio.

Sit 1 ad v vt distantia media ad excentricitatem, quae ergo ratio datur et proinde v . Multiplicetur sinus totus per $\frac{v^3}{4}$, et factum erit sinus cuiusdam anguli ex tabulis inueniendi: sit hic angulus q graduum. Haec vero operatio commodius per logarithmos instituetur.

Deinde quaeratur logarithmus quantitatis $v - \frac{v^7}{32}$, vel tantum ipsius v , ex tabulis logarith. num. naturalium, si fuerit v admodum paruum, iste logarithmus addatur ad hunc $5,3144295$, et logarithmi, qui prodit, quaeratur numerus respondens, qui sit n ; vbi notetur n'' esse dimidiam partem aequationis maximae; ita vt, si aequatio maxima iam fuerit inuenta hac posteriori operatione nequidem sit opus. Dico fore anomaliam mediam quaesitam $90^\circ + q^\circ + n''$. Q. E. I.